Notice of Allowability	Application No.	Applicant(s)	
	10/621,113	LAMBETH ET AL.	
	Examiner	Art Unit	
	Tekchand Saidha	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *May 06, 2005 (election)*.

2. ☒ The allowed claim(s) is/are *1-6,21 and 24-31*.

3. ☒ The drawings filed on *16 July 2003* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 5/21/2004 & 5/6/2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Notice of Allowability

1. Applicants' response to restriction requirement, amendment to claims and arguments filed May 6, 2005 is acknowledged. Claims 1-6 & 21 are pending and under consideration in this examination.

2. ***Election/Restriction***

Applicant's election with traverse of Group 2 (claims 1-6 & 20; SEQ ID NO: 4) is acknowledged. The traversal is on the ground(s) that the proteins of Groups II regulate an enzyme involved in the production of superoxide. These proteins regulate NADPH-oxidase (NOX1), but are not isolated NOX1 proteins themselves.

Groups 1, 2, 3 and 4 are each drawn to an isolated protein of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6 and SEQ ID NO: 8 respectively. The amino acid sequence set forth in SEQ ID NO: 4 is a protein that regulates superoxide production and is 371 amino acids in length. Using the amino cid sequence of SEQ ID NO: 4 as a reference, SEQ ID NO: 2 is a variant of SEQ ID NO: 4 and differs by a single amino acid. Similarly the amino acid sequence of SEQ ID NO: 6 is 376 amino acids in length and SEQ ID NO: 8 is 375 amino acid in length and are variants (by addition). The sequences of SEQ ID Nos. 2, 4, 6 & 8 by sequence comparison vary by about 5% among each other.

In conclusion Applicants believe that the claimed proteins of SEQ ID Nos. 2, 4, 6 & 8 (Groups 1-4) be searched together and request the restriction requirement be revised.

Applicants' arguments have been considered and found to be persuasive. According prior groups 1-4 are combined into one group (group 1) for examination. In view of this change, the restriction requirement is also revised into the following 6 groups. In view of this change and the examination of groups 1-4, as per Applicants' request, Applicants' traversal of the restriction requirement is now moot.

Revised Restriction

Group 1, claim(s) 1-6 & 21, drawn to an isolated proteins of SEQ ID NO: 2, 4, 6 or 8, regulating Nox enzyme (NADPH-oxidase) and composition thereof, classified in class 424, subclass 94.4.

Group 2, claim(s) 7-12, drawn to an isolated nucleic acid of SEQ ID NO: 1, 3, 5 or 7, encoding the proteins regulating Nox enzyme (NADPH-oxidase), vector & host cells, classified in class 435, subclass 252.3.

Group 3, claim(s) 13, drawn to antibody to SEQ ID NO: 2, 4, 6 or 8, classified in class 530, subclass 387.1.

Group 4, claim(s) 14-15 & 22, drawn to use of protein (regulating super-oxide formation) of SEQ ID NO: 2, 4, 6 or 8, classified in class 435, subclass 4.

Group 5, claim(s) 16-18 & 23, drawn to use of vector (regulating super-oxide formation) comprising SEQ ID NO: 1, 3, 5 or 7, classified in class 435, subclass 320.1.

Group 6, claim(s) 19-20, drawn to a method of determining the effect of a compound on superoxide production following administration of proteins of SEQ ID NO: 2, 4, 6 or 8, regulating Nox enzyme (NADPH-oxidase), classified in class 435, subclass 69.2.

Explanation pertaining to how the inventions are distinct can be found in the prior Office Action. Applicants' were informed of this change, i.e., decreasing the number of restricted groups from 24 to 6, during a telephone interview with Susan Alpert Siegel on June 3, 2005.

3. Claims 1-6, 21 & 24-27 drawn to an isolated proteins of SEQ ID NO: 2, 4, 6 or 8, regulating Nox enzyme (NADPH-oxidase) are present in this application. Claims 28-31 have been added by the following Examiner's amendment.

Accordingly, claims **1-6, 21 & 24-31** are under consideration in this examination.

4. ***Priority***

Applicant's claim for domestic priority under 35 U.S.C. 119(e), filed 11 August 23, 2002 & July 16, 2002, is acknowledged.

5. **Claims 1-6, 21 & 24-31 are allowed,** subject to the following Examiner's amendment. All the allowed claims are presented in this Office Action.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Susan Alpert Siegel on June 3, 2005.

Cancel claims 7-20 & 22-23 without prejudice.

Rewrite claims 1-6, 21 & 24-27 as follows:

1. An isolated protein, comprising an amino acid sequence set forth as SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, or SEQ ID NO:8, or a conservative substitution thereto of less than 5% of the amino acid sequence, wherein the protein regulates an enzyme involved in the production of reactive oxygen intermediates.

2. The isolated protein of claim 1, comprising a conservative substitution of less than 1% of the amino acid sequence set forth as SEQ ID NO: 4.

3. The isolated protein of claim 1, comprising a conservative substitution of less than 1% of the amino acid sequence set forth as SEQ ID NO: 2, SEQ ID NO: 6 or SEQ ID NO: 8.

4. The isolated protein of claim 1, wherein the isolated protein regulates superoxide production.

5. The isolated protein of claim 4, wherein the protein regulates a NADPH-oxidase (Nox) enzyme.

6. An isolated protein comprising an amino acid sequence set forth as SEQ ID NO:4, SEQ ID NO: 2, SEQ ID NO: 6, SEQ ID NO: 8 or a conservative substitution thereof of less than 5% of the amino acids of SEQ ID NO: 4, SEQ ID NO: 2, SEQ ID NO: 6 or SEQ ID NO: 8, wherein the conservative substitution comprises substitution of:

a) alanine, serine, or threonine for each other;

b) aspartic acid or glutamic acid for each other;

c) asparagine or glutamine for each other;

d) arginine or lysine for each other;

e) isoleucine, leucine, methionine, or valine for each other; and,

f) phenylalanine, tyrosine, or tryptophan for each other

wherein the protein regulates an enzyme involved in the production of reactive oxygen intermediates.

21. A composition comprising the isolated protein of claim 1 and a pharmaceutically acceptable carrier.

24. The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 4.

25. The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 6.

26. The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 8.

27. The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 2.

The following new claims are added:

28. (New) The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 2 or a conservative substitution thereto of less than 5% of the amino acids, wherein the protein regulates an enzyme involved in production of reactive oxygen intermediates.

29. (New) The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 4 or a conservative substitution thereto of less than 5% of the amino acids, wherein the protein regulates an enzyme involved in production of reactive oxygen intermediates.

30. (New) The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 6 or a conservative substitution thereto of less than 5% of the amino acids, wherein the protein regulates an enzyme involved in production of reactive oxygen intermediates.

31. (New) The isolated protein of claim 1, comprising an amino acid sequence set forth as SEQ ID NO: 8 or a conservative substitution thereto of less than 5% of the amino acids, wherein the protein regulates an enzyme involved in production of reactive oxygen intermediates.

6. The following is an examiner's statement of reasons for allowance:

The application provides novel isolated proteins of SEQ ID NO: 2, 4, 6 or 8, regulating Nox (NADPH-oxidase) enzyme, and composition thereof. No prior art reference or sequence of record would provide motivation to one of ordinary skill in the art to use the skills available in the area of molecular

biology/enzymology to make the claimed protein sequences or the composition comprising the specific proteins, obvious.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tekchand Saidha (Ph.D.) whose telephone number is (571) 272-0940. The examiner can normally be reached on Monday-Friday from 8:15 am to 4:45 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy, can be reached at (571) 272-0928. The fax phone number for this Group in the Technology Center is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is 571 272-1600.

T K Saidha 6/6/05

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June 6, 2005